Name: Date:

Polynomial Factoring solution (version 19)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 144}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-80}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{8 \pm 4\sqrt{5}\, i}{2}$$

$$x = 4 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 7i$ and $5 + 4i$ in standard form ($a + bi$).**

Solution

$$(6 + 7i) \cdot (5 + 4i)$$

$$30 + 24i + 35i + 28i^2$$

$$30 + 24i + 35i - 28$$

$$30 - 28 + 24i + 35i$$

$$2 + 59i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 23x - 60$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	2	-23	-60
5		5	35	60
	1	7	12	0

$$f(x) = (x-5)(x^2+7x+12)$$

$$f(x) = (x-5)(x+4)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-4)^2 \cdot (x-7)$$

Sketch a graph of polynomial $y = p(x)$.